

New Records and New Species of the Genus *Lebbeus* (Caridea: Hippolytidae) in the Eastern Pacific Ocean

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Abstract.—New records and new species of the genus *Lebbeus* (Caridea: Hippolytidae) in the eastern Pacific Ocean by Mary K. Wicksten and Matilde Méndez G., *Bull. Southern California Acad. Sci.*, 81(3):106–120, 1982. *Lebbeus scrippsi* n. sp. and *L. splendidus* n. sp. are described from off the coasts of Peru and Chile. *Lebbeus vicinus montereyensis* n. subsp. is described from Monterey Bay, California and off western Mexico. Southern range extensions are given for *L. grandimanus*, *L. lagunae*, *L. possjeticus*, and *L. zebra*. *Lebbeus brandti* is reported for the first time in the eastern Pacific. We suggest that *L. curvirostris* Zarenkov may belong to the genus *Nauticaris*, and that *L. bidentatus* Zarenkov may be a southern race of *L. washingtonianus* (Rathbun). A key is presented for all the species of *Lebbeus* in the eastern Pacific.

Shrimps of the genus *Lebbeus* inhabit cool temperate to Arctic waters. The majority of species are recorded from the northern Pacific Ocean. Keys to the species, illustrations, and distributional data have been given previously by Rathbun (1904), Wicksten (1979), and Butler (1980). Recent examination of specimens from the Allan Hancock Foundation (AHF), the Instituto del Mar del Perú (IMARPE), Scripps Institution of Oceanography (SIO), and the U.S. National Museum of Natural History (USNM) has resulted in the finding of two undescribed species, a new subspecies, and additional distributional data.

Lebbeus scrippsi n. sp. Plates 1–2

Description.—Rostrum short, not reaching end of second segment of antennular peduncle. One spine on dorsal surface of carapace posterior to orbit. One to 4 spines on dorsal surface of rostrum proper, 2 or 3 on ventral surface posterior to apex.

Carapace smooth. Supraorbital, antennal, and pterygostomial spines present.

Abdomen smooth. Pleura of segments 1 to 4 rounded. Pleura of segment 5 with sharp distolateral points. Sixth segment 1.25× as long as fifth, with sharp lateral points. Telson with 3 pairs dorsal spines placed at half length of telson and posteriorly. Tip of telson rounded, with 2 pair spines and setae. Telson 1.25× length of sixth abdominal segment.

Eyes small. Cornea of eye darkly pigmented, reaching base of posterior ventral rostral spine.

First segment of antennular peduncle with sharp spine on ventral margin of median border. Three sharp spines along distal margin of first segment. Second segment 0.5× as long as first, with sharp distal spine. Third segment about 0.5× as long as second, with sharp distal spine. Antennular peduncle shorter than scaphocerite. Upper antennular flagellum thickened, consisting of single ramus.

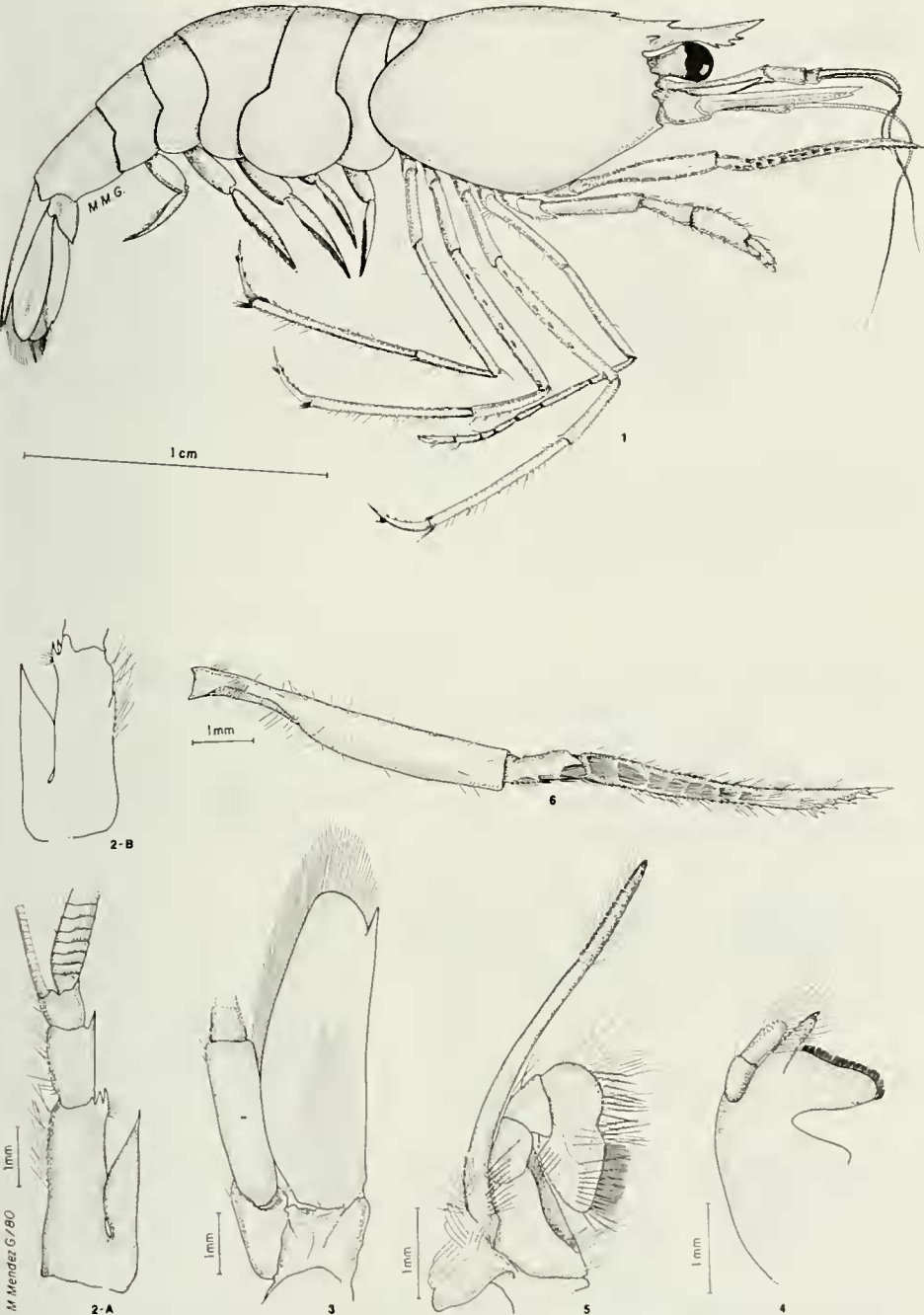


Plate 1. *Lebbeus scrippsi*, n. sp. Female paratype, 32.0 mm total length. Off Altura de Pucusana, Peru. Fig. 1. Body in lateral view; 2A, right first antenna; 2B, left first antenna; 3. right second antenna and scaphocerite; 4, right mandible; 5, right second maxilliped; 6, right third maxilliped in median view.

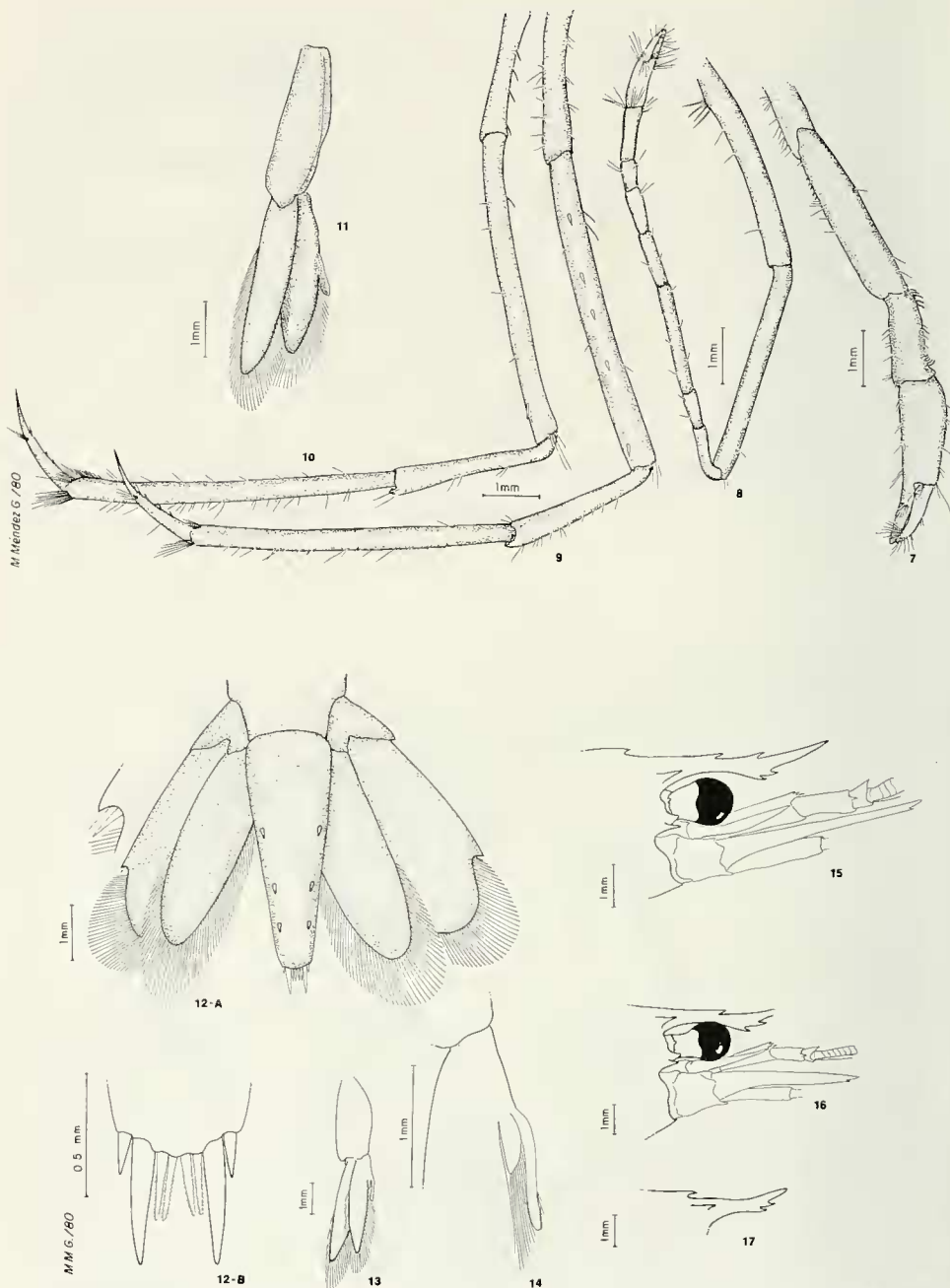


Plate 2. *Lebbeus scrippsi*, n. sp. 7, right first pereiopod; 8, right second pereiopod; 9, right fourth pereiopod; 10, right fifth pereiopod; 11, right second pleopod in frontal view; 12A and B, telson and uropod. 13-14, male, from south of Mollendo, Peru. 13, right second pleopod in frontal view; 14, appendices masculina and interna. 15-17, individuals from south of Mollendo, Peru, showing variations in shape. 15-16, anterior part of body; 17, unusual rostrum.

Scaphocerite $2.8\times$ as long as wide. Outer margin straight, with strong final tooth, blade exceeding tooth. Antennular peduncle reaching distal three-quarters of scaphocerite. Two sharp spines at base of scaphocerite.

Mandible with slender incisor process, ending in 2 teeth. Molar process bearing numerous spinules. Palp two-jointed. First maxilla with slender lower endite, broad upper endite, and stout palp. Second maxilla with lower endite reduced, consisting of 2 lobes. Upper endite larger and bilobed. Scaphognathite and palp well developed. First maxilliped with bilobed epipod. Endites of coxa and basis separated by notch. Palp two-jointed. Caridean lobe large. Second maxilliped with epipod, podobranch, and exopod. Third maxilliped reaching beyond scaphocerite. Ultimate segment about $3\times$ longer than penultimate, slightly shorter than antepenultimate. Sharp, dark spines at end of ultimate segment. Epipod present, but no exopod. Branchial formula:

	Maxillipeds			Pereiopods				
	1	2	3	1	2	3	4	5
Pleurobranchs	—	—	—	+	+	+	+	+
Arthrobranchs	—	—	—	—	—	—	—	—
Podobranchs	—	+	—	—	—	—	—	—
Epipods	+	+	+	+	+	—	—	—
Exopods	+	+	—	—	—	—	—	—

First pereiopods shorter than scaphocerite, chelate. Dactyl $0.4\times$ propodus. Propodus stout. Carpus $0.84\times$ length of propodus. Merus twice length of carpus. Ischium $0.4\times$ length of merus.

Second pereiopods longer than scaphocerite, chelate. Dactyl $0.5\times$ length of propodus. Carpus with 7 segments, the third of these the longest. Entire carpus $5\times$ length of propodus. Merus $0.5\times$ length of carpus. Ischium same length as merus.

Third pereiopods longer than scaphocerite. Dactyl simple, slender, $0.4\times$ length of propodus. Carpus $0.5\times$ length of propodus. Merus twice length of carpus, with 5–6 spines. Ischium $0.5\times$ length of merus. Fourth pereiopod similar to third, but with 4–5 meral spines. Fifth pereiopod similar to fourth, but without meral spines.

Second pleopods with appendix interna in both sexes. In male, appendix masculina much longer than appendix interna.

Uropods equal to telson, broadly ovate. Exopod with straight outer margin ending in small tooth. A larger tooth internal to this tooth.

Material.—HOLOTYPE: AHF 724; female, ovigerous. Off Arica, Chile ($18^{\circ}40.5'S$, $70^{\circ}36.0'W$ to $18^{\circ}32.2'S$, $70^{\circ}29.8'W$), 768–968 m. 25-foot otter trawl, 7 May 1972, R.V. *Thomas Washington*, R. Wisner and S. Luke, collectors. SIO station MV72-II-27. Male, paratype, AHF; female, paratype, SIO, female, paratype, USNM. Twenty-two additional specimens in this lot, all returned to SIO.—Paratypes, male and female. Off Altura de Pucusana, Peru ($12^{\circ}33'S$, $77^{\circ}22.5'W$), 800 m, 4 February 1972, *SNP-1* station 31, cruise 7201, L. A. Flores and L. Curotto, collectors, IMARPE.—Additional material: 7 specimens, one with sacculinid. Off Arica, Chile ($18^{\circ}44.7'S$, $70^{\circ}40.7'W$ to $18^{\circ}40.2'S$, $70^{\circ}35.1'W$), 1108–1164 m, 25-foot otter trawl, 7 May 1972, R.V. *Thomas Washington*, R. Wisner and S. Luke, collectors, SIO station MV72-II-26, SIO.—2 specimens. South of

Mollendo, Peru (17°05'S, 72°16.9'W), 800 m, dredged, 27 January 1972, *SNP-1* station 7, cruise 7201, L. A. Flores and L. Curotto, collectors, IMARPE.

Measurements in millimeters.—Holotype: total length 31.5, rostrum 3.0, carapace 8.4, abdomen 14.6, telson 3.5, (broken at tip), scaphocerite 5.2, third maxilliped 10.3, first pereopod 10.5, second pereopod 15.6, third pereopod 16.8. Total lengths (tip of rostrum to end of uropods) of paratypes: 37.5, 41.2, 36.5, 27.6, 32.0.

Remarks.—*Lebbeus scrippsi* is related to *L. polaris* (Sabine), *L. grandimanus* (Brazhnikov), and *L. brandtii* (Brazhnikov). Both *L. brandtii* and *L. grandimanus* have short rostra, not exceeding the scaphocerite. *Lebbeus brandtii* has no ventral teeth on the rostrum posterior to the apex. It has a pronounced hump on the dorsal surface of the third abdominal segment (Balss 1914). *Lebbeus grandimanus* has 4 large teeth on the carapace posterior to the orbit. *Lebbeus polaris* has a rostrum longer than the scaphocerite, with 0–2 dorsal spines and 3–4 ventral spines. None of these related species is known to occur on the western coast of South America.

Taken with *Lebbeus scrippsi* at stations 7 and 31 were the penaeid shrimp *Benthocyclus tanneri* Faxon, the caridean shrimps *Acantheephyra approxima* Bate, *Pasiphaea magna* Faxon, *Glyphocrangon alata* Faxon, and *Sclerocrangon atrox* Faxon; the polychelid lobster *Stereomastis sculpta pacifica* (Faxon), the deep-sea lobster *Nephropsis occidentalis* Faxon, the axiid lobster *Iconaxius cristagalli* (Faxon), the galatheid crabs *Munidopsis hamata* Faxon, *Munidopsis quadrata* Faxon, and *Munida propinqua* Faxon; the lithodid crab *Lithodes panamensis* Faxon, and the brachyuran crabs *Trachycarcinus hystericus* Garth and *Trachycarcinus corallinus* Faxon. The bottom at station 31, cruise 7201 was soft mud with detritus (del Solar and Flores 1972; Méndez 1979).

Lebbeus scrippsi is named in honor of Scripps Institution of Oceanography.

Lebbeus splendidus n. sp.

Plates 3–5

Description.—Rostrum long, upcurved, exceeding scaphocerite. Two spines on dorsal surface of carapace posterior to orbit, 2–3 spines on rostrum proper. Distal half of upper margin bare of spines. Five to 9 lower spines, the proximal 4 closer together than the other spines. Apex acute.

Carapace smooth. Supraorbital spine tiny. Antennal and pterygostomial spines present. Groove along distal branchial region.

Abdomen smooth. Pleura of segments 1–4 rounded. Third segment broadly overreaching fourth on dorsal margin. Pleura of segment 5 with sharp points. Sixth segment 1.5× length of fifth, with sharp lateral points. Telson with 3 pairs dorsal spines placed just before half its length and posteriorly. Tip of telson rounded, with 2 pair long spines and 4 setose spines. Telson 1.3× as long as sixth abdominal segment.

Eyes large, rounded. Cornea darkly pigmented, reaching base of second dorsal spine of rostrum.

First segment of antennular peduncle with 2 sharp spines on dorsal distal margin. Stylocerite sharp, as long as first segment. Second segment 0.75× length of first, with sharp distal spines. Third segment very short, 0.33× length of second seg-

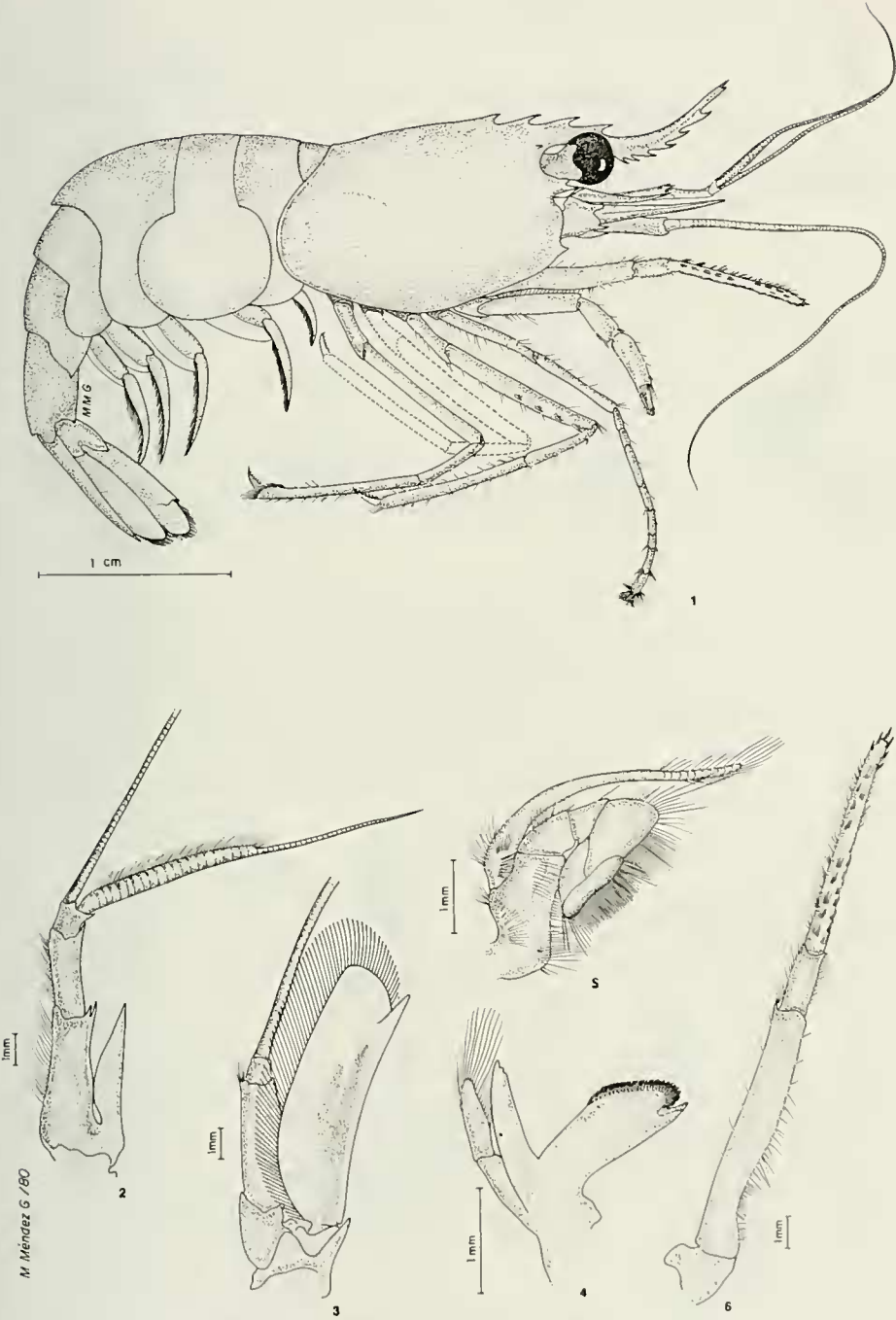


Plate 3. *Lebbeus splendidus*, n. sp. Female, 51.2 mm, southwest of Lobos de Tierra, Peru. Fig. 1, lateral view; 2, right first antenna; 3, right second antenna; 4, right mandible; 5, right second maxilliped; 6, right third maxilliped in media view.

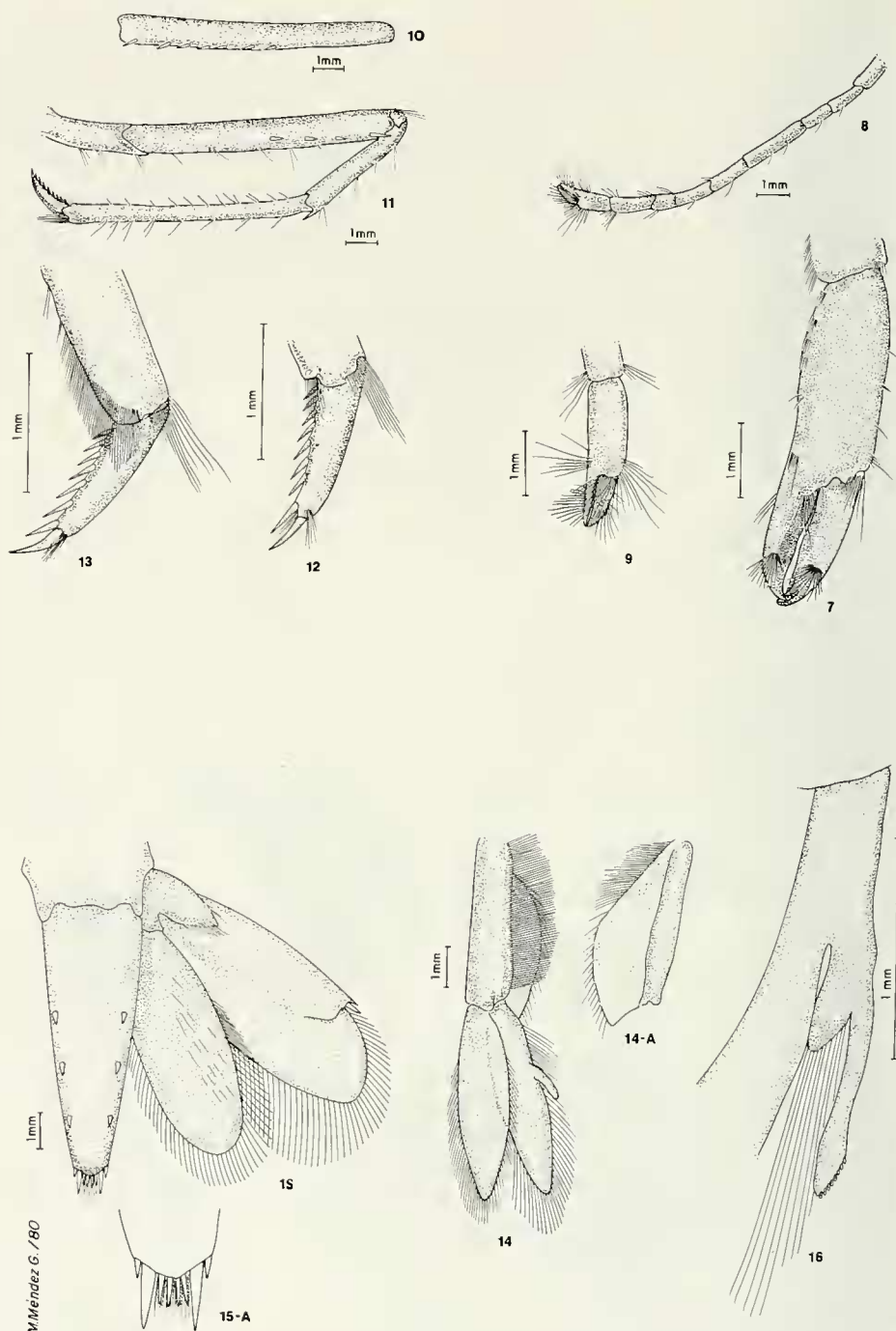


Plate 4. *Lebbeus splendidus*, n. sp. 7, chela of right first pereopod; 8, carpus and chela of right second pereopod; 9, chela of right second pereopod; 10, merus of left third pereopod; 11, right third pereopod; 12, dactyl of right third pereopod; 13, dactyl of right fifth pereopod; 14, right second pleopod in frontal view; 14A, basipodite of right second pleopod; 15, telson and uropods; 15A, apex of telson; 16, right second pleopod from male 37.9 mm total length, southwest of Lobos de Tierra, Peru, showing appendices masculina and interna.

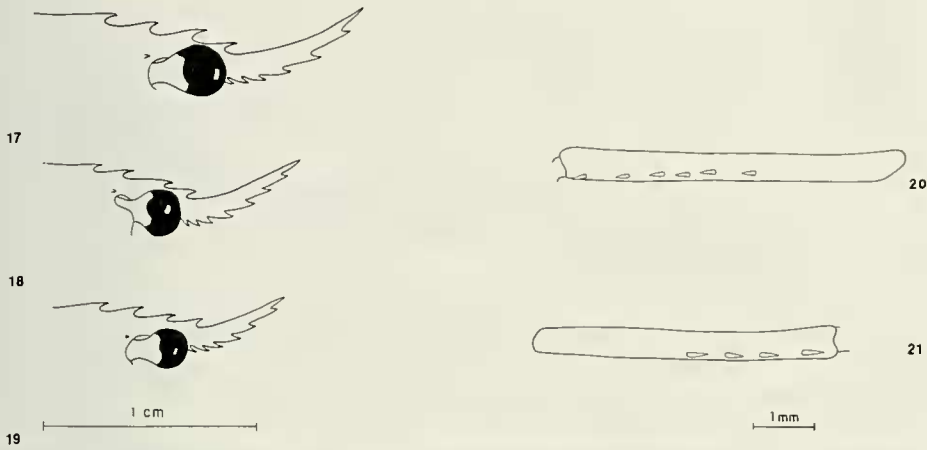


Plate 5. *Lebbeus splendidus*, n. sp. 17–19, eyes and rostra, showing variation. 17, from female 50.0 mm total length; 18, from male, 37.9 mm total length; 19, from female, 34.2 mm total length. 20, merus of left third pereopod from male, 37.9 mm total length; 21, merus of right third pereopod from female, 34.2 mm total length.

ment, with sharp distal spine. Antennular peduncle shorter than scaphocerite. Upper antennular flagellum thickened, consisting of single ramus.

Scaphocerite 2.66× as long as wide. Outer margin slightly concave, with strong final tooth; blade exceeding tooth. Antennular peduncle reaching nearly to tooth. Two spines present at base of scaphocerite.

Mandible, maxillae, and maxillipeds resembling those of *L. scrippsi*.

Branchial formula:

	Maxillipeds			Pereiopods				
	1	2	3	1	2	3	4	5
Pleurobranchs	–	–	–	+	+	+	+	+
Arthrobranchs	–	–	–	–	–	–	–	–
Podobranchs	–	+	–	–	–	–	–	–
Epipods	+	+	+	+	+	–	–	–
Exopods	+	+	–	–	–	–	–	–

First pereiopods shorter than scaphocerite, chelate. Dactyl 0.25–0.3× length of propodus. Carpus 0.75× length of propodus. Merus twice length of carpus. Ischium 0.17× length of merus.

Second pereiopods longer than scaphocerite, chelate. Dactyl 0.4× length of propodus. Carpus with 7 segments, the third of these the longest. Entire carpus 5× length of propodus. Merus 0.6× length of carpus. Ischium same length as merus.

Third pereiopods longer than scaphocerite. Dactyl slender, about 0.2× length of propodus. Merus 2× length of carpus, with 4–7 sharp distal ventral spines. Ischium 0.4× length of merus. Fourth pereiopod similar. Fifth pereiopod without meral spines.

Second pleopods with narrow, ovate endopods and exopods in both sexes. Appendix interna present. In male, appendix masculina longer than appendix interna.

Uropods longer than telson, broadly ovate. Exopod with straight outer margin ending in small tooth. A larger tooth internal to this tooth.

Material.—HOLOTYPE, AHF 7116; female, ovigerous. Southwest of Lobos de Tierra, Peru ($6^{\circ}31'S$, $81^{\circ}01'W$), 712–744 m, 17 May 1971, *SNP-1* station 12, cruise 7105, E. M. del Solar, M. Viacava, and J. Velez, collectors.—Six females and two males, paratypes, same station, IMARPE.—Paratype, female. Between Lobos de Tierra and Lobos de Afuera, Peru ($6^{\circ}42'S$, $80^{\circ}47'05''W$), 1090–1100 m, 22 January 1974, beam trawl, *SNP-1* station 23, USNM.—One additional female, same station, AHF.

Measurements in millimeters.—Holotype: total length (tip of rostrum to tip of telson) 50.1, rostrum 11.9, carapace 11.2, abdomen 20.7, telson 8.3, third maxilliped 17.1, scaphocerite 6.6, first pereopod 13.2, second pereopod 19.4, third pereopod 26.6. Total lengths of other specimens: 44.2, 40.7, 36.3, 53.5, 29.8, 51.2, 50.0, 37.9, 34.2.

Remarks.—*Lebbeus splendidus* resembles *L. polaris* from Arctic waters. Both species have epipods on the first two pereopods. The rostrum of *L. polaris*, with only 3–4 ventral spines, does not curve as prominently as that of *L. splendidus*. *Lebbeus polaris* has one spine at the distal end of the first segment of the antennular peduncle, *L. splendidus* has two spines. The dactyls of the third pereopods in *L. polaris* end in two stout spines, those of *L. splendidus* are slender. In *L. splendidus* there is a tuft of setae at the distal end of the propodus of the third pereopod.

Taken with *L. splendidus* at station 12, cruise 7105 was the peneid shrimp *Benthescymus* sp., the carideans *Heterocarpus hostilis* Faxon, *Heterocarpus affinis* Faxon, *Pantomus affinis* Chace, *Acantheephyra approxima*, *Nematocarcinus agaszii* Faxon, and *Bathypalaemonella* sp; the hermit crab *Pagurus* sp., and the lithodid crabs *Lithodes* ? *panamensis* and *Glyptolithodes cristatipes* Faxon.

Lebbeus vicinus montereyensis n. subsp.

Plate 6

Lebbeus polaris: Wicksten, 1978:6, fig. 6.

Not *Alpheus polaris* Sabine 1821:238, pl. II, figs. 5, 8.

Description.—Rostrum of female long and slender, usually longer than scaphocerite, slightly upcurved in anterior part. Rostrum of male shorter than scaphocerite. Upper margin with 3–4 teeth, 2–3 of them on carapace. Lower margin with 4 teeth.

Carapace smooth, arched dorsally, with median dorsal carina running nearly 0.75 of its length, with supraorbital, antennal, and pterygostomial spines.

Abdominal segments rounded dorsally, the third with posterior margin triangularly produced in the median. Pleura of first 4 segments rounded, that of fifth shaped like broad, blunt triangle. Sixth segment $1.75\times$ length of fifth, ending in sharp point. Telson reaching at least to end of uropods, but broken in all specimens; bearing 2 pair small spines along posterolateral margin.

Eyes large, darkly pigmented, reaching about $0.75\times$ length of first segment of antennular peduncle.

Antennular peduncle shorter than antennal scale. First segment longest, with prominent sharp spine at upper distal margin and lateral blunt process which overreaches articulation with second segment. Stylocerite strong, sharp, reaching

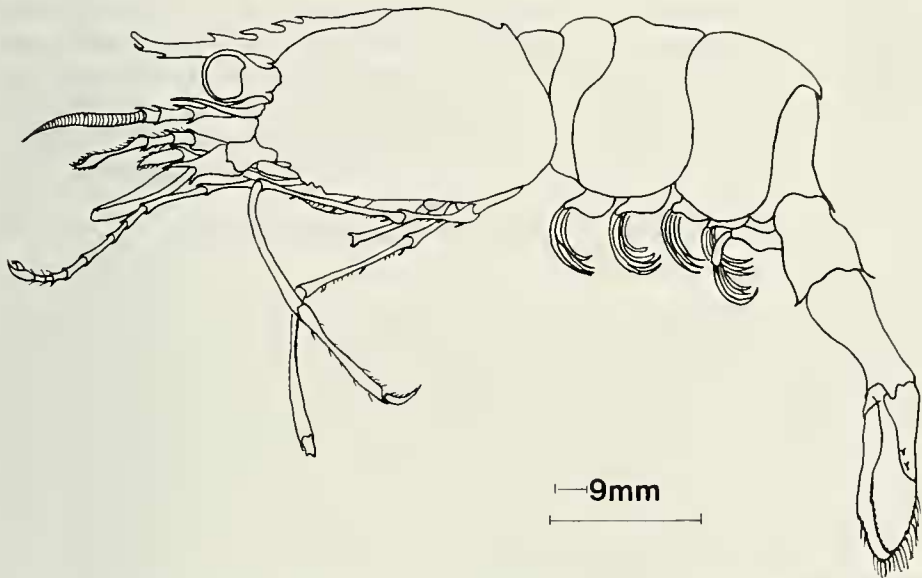


Plate 6. *Lebbeus vicinus montereyensis*, n. subsp. Female, 58.3 mm total length. Off Punta Banda, Baja California, Mexico. Frontal margin of carapace, rostrum, telson, and pereiopods broken in this specimen.

end of first segment. Second segment about 0.5× length of first, with spine on dorsal anterior margin. Third segment small, about 0.5× length of second, with sharp dorsal tooth. Inner flagellum slender, outer flagellum short and broad.

Antennal peduncle reaching beyond middle of scaphocerite. Scaphocerite shorter than female rostrum, with broad lamella greatly overreaching lateral tooth.

Mandible with distinct incisor process and two-jointed palp. First maxilla with bilobed palp, broad upper endite and narrow lower endite. Second maxilla with lower endite reduced to 2 short lobes. Upper endite large, bilobed. Palp and scaphognathite well developed. First maxilliped with exopod, two-jointed palp, epipod, and prominent caridean lobe. Second maxilliped with epipod and podobranch. Third maxilliped without exopod but with epipod; overreaching scaphocerite. Ultimate segment 3.5× length of penultimate, shorter than antepenultimate. Ultimate segment with prominent distal spines and setae. Antepenultimate segment with distinct outer anterolateral tooth. Branchial formula:

	Maxillipeds			Pereiopods				
	1	2	3	1	2	3	4	5
Pleurobranchs	—	—	—	+	+	+	+	+
Arthrobranchs	—	—	—	—	—	—	—	—
Podobranchs	—	+	—	—	—	—	—	—
Epipods	+	+	+	+	—	—	—	—
Exopods	+	+	—	—	—	—	—	—

First pereiopods strong and short, chelate. Dactyl less than 0.5× propodus. Carpus equal to palm, merus 1.5× propodus. Second pereiopod long and slender, exceeding scaphocerite by entire chela and last 3 carpal segments. Chela small,

about $0.2\times$ carpus. Carpus with 7 segments, the third by far the longest. Merus about $0.6\times$ carpus. Ischium slightly shorter than merus. Third pereopod with dactyl about $0.2\times$ propodus, provided with 6 spines. Carpus about $0.6\times$ propodus. Merus about as long as propodus, with 1 prominent distolateral spine and 4–6 smaller lateral spines. Fourth pereopod similar to third, but with only 4 smaller lateral meral spines as well as prominent spine. Fifth pereopod with 3 small lateral meral spines, but no prominent distolateral spine.

Second pleopod of female with appendix interna; that of male with appendix interna and appendix masculina.

Uropods broad, ovate.

Material.—HOLOTYPE: AHF 606; female. West of Punta Banda, Baja California, Mexico ($31^{\circ}18'N$, $117^{\circ}36'W$), 2068–2086 m, 30-foot otter trawl, 13 February 1960, Parker and Yonge, collectors; SIO catalogue number C2572. Also two ovigerous females, paratypes, same station, to SIO and male, smashed, AHF.—Female, “Gulf of California,” 2824 m, 8 March 1959, R. Wisner, collector, AHF.—Female, paratype. Monterey Submarine Canyon, California ($36^{\circ}45.3'N$, $122^{\circ}04.7'W$ to $36^{\circ}45.7'N$, $122^{\circ}04.8'W$), 954–1044 m, U.S.N.S. *De Steiguer* cruise, 19 November 1975, California Academy of Sciences.

Measurements in millimeters.—Holotype: total length 65.7, rostrum 10.0, carapace 15.0, abdomen and telson 37.7, telson 6.9 (broken), third maxilliped 21.6, first pereopod 17.2, second pereopod 25.1, third pereopod 31.6. Total lengths of other specimens: 58.3, 50.5, 31.6, 58.8.

Remarks.—We have compared our material of the new subspecies with the types and two other specimens of *L. vicinus vicinus* (Rathbun) from Alaskan waters. Our specimens differ from the northern subspecies primarily in having fewer dorsal spines on the rostrum and carapace. The northern shrimp have 6–8 dorsal spines; the southern ones have only 3–4. In northern females, the pterygostomial spine is more prominent than in southern females. The pleura of the fifth abdominal segment often end in sharp points in northern specimens rather than in a triangle. The last 2 spines of the dactyl of the third pereopod in northern specimens often are stout, giving the dactyl the appearance of being biunguiculate. The stylocerite of the northern subspecies does not reach the end of the first segment of the antennular peduncle. In the southern subspecies, the stylocerite reaches to the end of this segment.

The description and illustration given by Rathbun (1902, 1904, as *Spirontocaris vicina*) are brief. Our material from California and Mexico, however, generally is similar to the northern specimens. It is difficult to state the degree of variation in a species known from so few individuals, especially when they are separated by a great distance. We suspect, however, that our southern specimens show adaptations to life at greater depths. Our material was collected at 954–2824 m; the northern subspecies, off Alaska at 570–750 m. Perhaps *L. vicinus* inhabits waters of a given cold temperature, living deeper in southern waters.

At the time of a previous study, only one specimen of the new subspecies was available. This animal, like all our specimens so far, was damaged. The lack of epipods on the second pereopods was assumed to be due to breakage. The specimen therefore was identified as *L. polaris* (Wicksten 1978). However, all specimens of the new subspecies lack epipods on the second pereopods. The distal margin of the pleura of the fifth abdominal segment in *L. polaris* forms a sharp

point, not a rounded triangle. No specimens of *L. vicinus* have the lamellate rostral form illustrated for *L. polaris* by Kobyakova (1955). *Lebbeus polaris* has not been reported south of Alaskan waters on the American Pacific coast (Butler 1980).

Lebbeus vicinus montereyensis is named after Monterey Bay, California, where one of the specimens was collected.

Comments on *Lebbeus curvirostris* and *Lebbeus bidentatus*

Zarenkov (1976) described three species of *Lebbeus* taken off Peru and Chile: *L. curvirostris*, *L. bidentatus*, and *L. carinatus*. We have been unable to examine material of any of these species. Of the three, *L. curvirostris* probably belongs to the genus *Nauticaris*. Members of this latter genus have arthrobranchs on all the pereopods, as described. *Lebbeus bidentatus* is similar to *L. washingtonianus* (Rathbun). It has epipods on the first three pereopods. The illustration of the broken holotype shows two spines on the anterodorsal part of the carapace and two on the dorsal part of the rostrum proper, with four ventral rostral spines. *Lebbeus washingtonianus* also has epipods on the first three pereopods. It has 1–2 anterodorsal spines on the carapace, three dorsal rostral spines, and 2–3 ventral rostral spines. In *L. bidentatus*, there are six spines on the merus of the third pereopod, in *L. washingtonianus*, there are five. Both have four meral spines on the fourth pereopod. The proportions of the segments of the antennular peduncle are similar. Both occupy the same depth range. *Lebbeus bidentatus* may represent a southern race of *L. washingtonianus*. *Lebbeus carinatus* differs from other species of *Lebbeus* in the eastern Pacific in having epipods on all of the first four pereopods.

Extensions of Range

Lebbeus brandti (Brazhnikov)

Recorded range.—Sagami Bay, Japan, 120 m (Balss 1914); Sea of Okhotsk, 12 m, 10–55 m (Brazhnikov 1907; Kobyakova 1937).

Material.—Three specimens. Smeaton Arm, Wilson Bay, Alaska (55°20'N, 130°50'W), 172 m, 17 Sept. 1981, trawl 903, VTN, Inc. collectors. One specimen with bopyroid isopod as parasite.

Remarks.—This is the first record of this species in the eastern Pacific Ocean.

Lebbeus grandimanus (Brazhnikov)

Recorded range.—Bering Sea, Commander Islands, Pribilof Islands to San Juan Island, Washington; Race Rocks, Okhotsk Sea, Sea of Japan, to Peter the Great Bay, 6–180 m (Butler 1980).

Material.—Three specimens. Northwest Island, Pond, Puget Sound, Washington, U.S.A., 1974, L. R. McCloskey, USNM.

Lebbeus lagunae (Schmitt)

Recorded range.—Pacific Grove to Tanner Bank, California (Wicksten 1978).

Material.—One specimen. Between Coronado Islands, Mexico and Pt. Loma, California (32°32.8'N, 117°15.5'W), 55 m, 26 Nov. 1949, Carl L. Hubbs station H49-116, AHF.—One specimen. Reef on south side of Punta Banda, Baja Cali-

fornia, Mexico (31°45'N, 116°50'W), depth not recorded, 3 Feb. 1951, Carl L. Hubbs station H51-21, AHF.

Lebbeus possjeticus Kobyakova

Recorded range.—Type locality, Possjet Bay, Pacific coast of U.S.S.R. (Kobyakova 1967).

Material.—One specimen. Bering Island, 3 m, donated by Zoological Institute of Leningrad, #957, USNM.—One specimen. Off San Nicolas Island, California (33°15'30"N, 119°24'40"W–33°16'10"N, 119°24'30"W), 52–57 m, rocks. 12 April 1940, R.V. *Velero III* station 1123–40, AHF.

Remarks.—This small shrimp may follow zones of cold water, occurring in deeper water toward the south. The specimens examined have prominent folds on the dorsal surface of the second abdominal segment, as mentioned by Butler (1980).

Lebbeus zebra (Leim)

Recorded range.—New Brunswick, Nova Scotia, and Chaleurs Bay, Newfoundland (Couture and Trudel 1968); Bering Sea and Kamchatka (Makarov 1935, as *Hetairus zebra*); British Columbia (Butler 1964).

Material.—Two specimens. 13 miles SSE of East Point, Santa Rosa Island, California (33°40'55"N, 119°52'30"W–33°42'32"N, 119°50'10"W), 113–140 m, with rocks, crinoids, sponges, and ophiuroids; 25 August 1941, *Velero III* station 1385-41, AHF.

Remarks.—We have compared our specimens with the shrimp taken off British Columbia by Butler (1964) and specimens taken at St. Mary Bay, Nova Scotia. The identity of the specimen from British Columbia "remains in doubt" (Butler 1980). It more closely resembles *L. schrencki* (Brazhnikov) than the animals from California, which conform closely to the animals from the east coast of Canada. The specimens from California lack a transverse furrow on the dorsal surface of the second abdominal segment.

Key to the Species and Subspecies of *Lebbeus* in the Eastern Pacific Ocean

- | | |
|---|--|
| 1. Epipods on only the first pereopods | 2 |
| – Epipods on at least the first and second pereopods | 3 |
| 2. Rostrum with 6–8 dorsal spines, stylocerite not reaching end of first segment of antennular peduncle | <i>Lebbeus vicinus vicinus</i> (Rathbun) |
| – Rostrum with 3–4 dorsal spines, stylocerite reaching end of first segment of antennular peduncle | <i>Lebbeus vicinus montereyensis</i> n. subsp. |
| 3. Epipods on first and second pereopods | 4 |
| – Epipods on at least first to third pereopods | 7 |
| 4. Carapace with 4 large dorsal spines posterior to orbit. (Often associated with sea anemone, <i>Cribrinopsis fernaldi</i>) | <i>Lebbeus grandimanus</i> (Brazhnikov) |
| – Carapace with 1–2 dorsal spines posterior to orbit. (Associations not known) | 5 |
| 5. Dactyl of third pereopod simple, without spines .. | <i>Lebbeus scrippsi</i> n. sp. |
| – Dactyl of third pereopod with spines | 6 |

6. First segment of antennular peduncle with 2 anteroexternal spines. Rostrum with 5–9 ventral spines *Lebbeus splendidus* n. sp.
- First segment of antennular peduncle with 1 anteroexternal spine. Rostrum with 4 or less ventral spines 7
7. Rostrum longer than antennular peduncle, with 3–4 ventral spines ...
..... *Lebbeus polaris* (Sabine)
- Rostrum barely reaching end of first segment of antennular peduncle, with 1 or no ventral spines *Lebbeus brandti* (Brazhnikov)
8. Epipods on first to fourth pereopods *Lebbeus carinatus* Zarenkov
- Epipods on first to third pereopods 9
9. Pleura of first to fifth abdominal segments ending in 1–3 spines
..... *Lebbeus groenlandicus* (Fabricius)
- Pleura of at least first to third abdominal segments pointed to rounded, but not ending in 1–3 spines 10
10. Rostrum reduced to spine on frontal margin of carapace. Three spines on anterior dorsal midline of carapace *Lebbeus lagunae* (Schmitt)
- Rostrum prominent, not reduced to spine. 1–2 spines on anterior dorsal midline of carapace 11
11. Antennular peduncle extending to near middle of scaphocerite. Small subtidal species 12
- Antennular peduncle extending nearly to end of scaphocerite. Large species of continental slopes 14
12. Dorsal surface of second abdominal segment without transverse furrow and fold. Rostrum shorter than eye *Lebbeus zebra* (Leim)
- Dorsal surface of second abdominal segment with transverse furrow and fold. Rostrum longer than eye 13
13. Rostrum short, not reaching end of first segment of antennular peduncle, with 2–5 dorsal spines and 1 ventral spine
..... *Lebbeus schrencki* (Brazhnikov)
- Rostrum reaching to end of scaphocerite, with 5–7 dorsal spines and 3–4 ventral spines *Lebbeus possjeticus* Kobyakova
14. First segment of antennular peduncle with 1 spine, bi- or trifurcated. Northern hemisphere *Lebbeus washingtonianus* (Rathbun)
- First segment of antennular peduncle with 3 spines. Southern hemisphere
..... *Lebbeus bidentatus* Zarenkov

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